West Virginia's Nonpoint Source Program

Annual Report 2008

west virginia department of environmental protection

January 2009

STATEMENT OF POLICY REGARDING THE EQUAL OPPORTUNITY TO USE AND PARTICIPATE IN PROGRAMS

It is the policy of the West Virginia Department of Environmental Protection to provide its facilities, services and programs to all persons without regard to sex, race, color, age, religion, national origin or handicap. Proper licenses/registration and compliance with official rules and regulations are the only sources of restrictions for facility use or program participation.

The Department of Environmental Protection is an equal opportunity employer.

Joe Manchin III, Governor

Randy C. Huffman, Cabinet Secretary

West Virginia's Nonpoint Source Program is funded by a Clean Water Act Section 319 Grant administered by the U.S. Environmental Protection Agency.

Table of Contents

Executive Summary

Subtle changes in West Virginia's approach to stream restoration have had some impacts on West Virginia's Nonpoint Source Program (NPSP). During FY 2008 (October 1, 2007 to September 30, 2008) the NPSP completed its first project incorporating a private corporation's mitigation requirements permit violation settlements into a project. Settlement funding was requested in support of ten other projects. The prospect of using mitigation funding in a comprehensive effort at restoring stream uses is starting to take shape. The NPSP with its watershed based plans (WBPs) has already completed much of the preliminary work needed to direct these funds to projects. The program is expected to play a vital role in this effort.

Acid mine drainage (AMD) has been the major focus of the NPSP for several years but approaches to the treatment of AMD are starting to focus more on active treatment than passive treatment. In Deckers Creek one FY 04 project was completed but an FY 06 project is the first 319 funded project being revised to switch from passive to active treatment. Two FY 04 projects in Lamberts Run were completed using passive systems with encouraging results. Also completed this year were two more AMD passive treatment systems in the Lower Cheat watershed and one in the Blackwater River, a tributary to the Cheat River.

Besides AMD the NPSP in 2008 has focused on a diversified variety of projects for stream bank restoration, on-site wastewater, agriculture, urban runoff and monitoring:

- Two projects to stabilize/restore eroding stream banks,
- One community cluster system for on-site wastewater treatment
- The construction of two rain gardens and outreach support for rain barrels
- Three project monitoring efforts in the Cheat, Deckers Creek and Morris Creek project areas and the statewide WV Save Our Streams Program (WVSOS) volunteer monitoring program.
- Two agricultural projects
- Four approved new WBPs and one submitted awaiting approval

Outreach and education are vital activities in the NPSP for changing attitudes and habits of people who have an impact on stream health. Table 1 provides the totals by agency or program. In total, 8,076 people attended workshops or events sponsored by the NPSP. This does not include other events where NPSP staff operated booths highlighting nonpoint source issues. An example is the WV Contractor's EXPO in March. Over 3500 attendees attended the EXPO and were assisted by WV Conservation Agency (WVCA) Conservation Specialists on sediment and erosion control issues at their booth. At the EXPO the WVCA Watershed Resource Center hosted a 1 ½ hour workshop on "Innovative BMPs for Sediment & Erosion Control" to over 100 attendees.

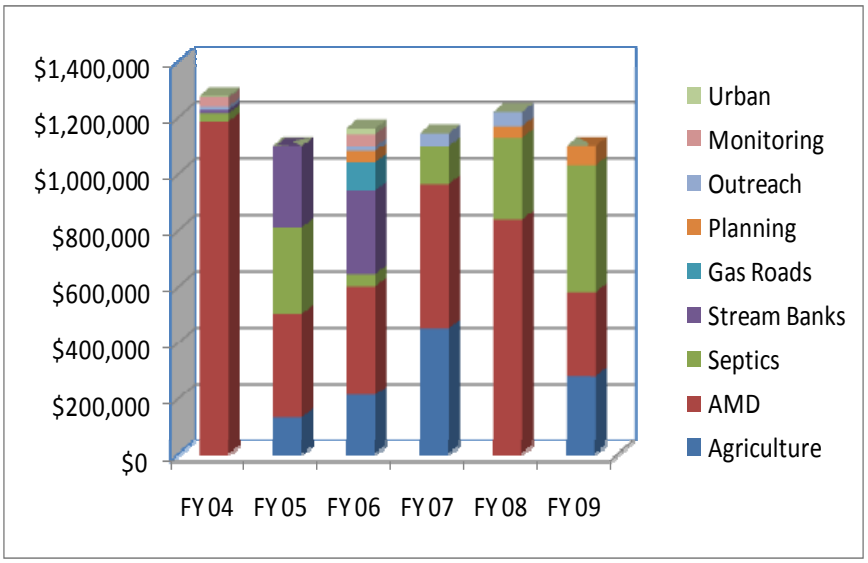
Table 1

NPSP Outreach and Education			
Partner	**Events**	**People**	**People/Event**
WVSOS	65	3108	47.82
DEP/NPSP	12	2000	166.67
Oil & Gas	5	313	62.60
WVCA	13	1609	123.77
Watershed Associations	5	1046	209.20
Totals	100	8076	80.76

In FY 2008 the NPSP offered again small grants totaling $155,316 for projects related to nonpoint source issues. These grants are offered to watershed associations, non-profit water issue organizations, academia and local government through an Announcement of Grant Opportunity (AGO). Nine organizations applied for and were awarded AGOs. The projects included one logging BMP research project, two outreach and education projects, one on-site wastewater workshop, one wetland restoration demonstration project, one stream bank restoration project, one monitoring project and two rain gardens.

The treatment of AMD from pre-SMCRA abandoned coal related sites still accounts for the greatest amount of 319 spending in West Virginia. Chart 1 shows the basic ratio of obligated 319 funds by category for the five open grant years of 2004 to

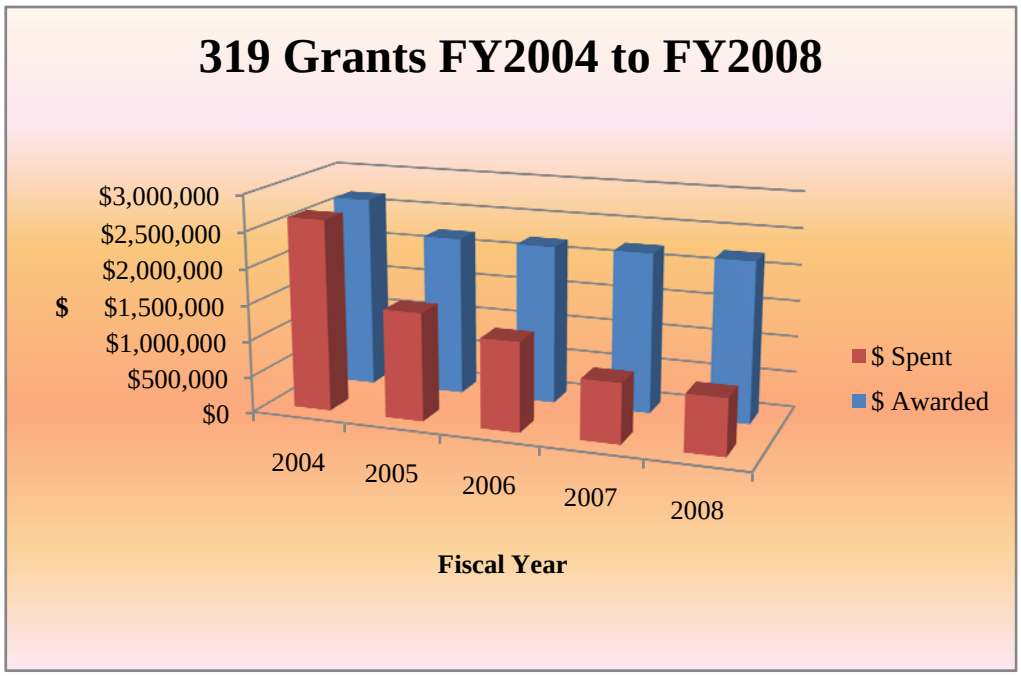
***Chart 1**: 319 Incremental Funding FY 04 to FY 09*



2008 and next year's requested 2009 grant. The chart shows that since FY 2004 there has been an increasing diversity in the types of 319 funded projects.

West Virginia's FY 2008 S319 grant totaled $2,127,600 with $1,024,400 going to the base program and $1,103,200 going to the incremental program. In FY 2008 five grant years were open accounting for $11,510,976 in Federal funds made available to West Virginia. The anticipated required non-federal match to these funds is $7,673,984 for a total potential estimated economic contribution of $19,184,960 expected from these five years of funding. The amount of S319 incremental funds still available on active projects after September 30, 2008 was $4,536,617. (Chart 2)

Chart 2: Money Awarded vs. Money Spent



Since 2006 four streams classified as impaired have been restored sufficiently enough to be classified as fully meeting designated uses. In 2008 two NPSP project streams showed significant improvement but data was not available in time for the 2008 Integrated Report. An intensive monitoring of these streams was conducted by NPSP personnel. Enough data was collected to show improvement but one stream, Morris Creek, still violates standards for metals.

In 2008 two nonpoint source success stories were submitted to EPA: Morris Creek for pH restoration and Long Branch for metals.

- Acid mine drainage from abandoned coal mines impaired 3.1 miles of Morris Creek in Kanawha County, West Virginia. Morris Creek and its tributaries of Possum and Blacksnake Hollows are meeting water quality standards for pH. The projects received funds of $312,683 from Watershed Cooperative Agreement Program (WCAP), $659,127 from AML and $690,167 of 319 funds from the NPSP.

- Long Branch is a tributary of Ten Mile Fork of Paint Creek that was heavily impacted by acid mine drainage. Starting near the headwaters 8,000 feet of the stream was lined with 10 inches of limestone. The limestone was placed in such a way as to maintain as closely as possible the natural hydrology of this high gradient stream. Two years after implementation pH is up to 6.3 and all metal concentrations are within standards. $176,807 of Section 319 funds were used with a match of $114,911 from the WCAP.

While completely removing a stream from the impaired streams list is an enormous challenge, all NPSP projects have achieved reductions in pollutant loads. Completely restoring a stream requires multiple projects and years of effort to reduce pollutant loads sufficiently. The load reductions reported during FY 2008 are listed in Table 2. Five projects completed in 2008 have not been monitored since completion and dry conditions meant some had not started to function. Older projects that are still functioning may be past the required monitoring period for the grantee.

Table 2

Load Reduction Estimates *Fiscal Year 2008 October 1, 2007 to September 30, 2008* *All units are in tons/year*								
FY	**Project**	**Sediment**	**Nitrogen**	**Phosphorus**	**Iron**	**Aluminum**	**Manganese**	**Acid**
2004	Oldaker				13.01	0.83		17.02
	Muzzleloader				1.65	0.75		107.5
	Morgan Run				20.9	4.5		78
2005	Morris Cr Phase I	583						
2008	WVCA Base Grant	558	37.5	33.3				
	TOTALS	1,141	37.5	33.3	35.56	6.08	0	202.52

FY 04 projects completed but not monitored in time for this report:
Lambert Run sites #5 and #9,
Cheat sites Jessop #1 and Middle Fork of Greens Run
Deckers Creek site of Valley Point 12

A Great Blue Heron makes a hasty retreat from fishing in the upper wetland treatment cell at the Muzzleloader project.

Nonpoint Source Program Overview

Introduction

West Virginia's Nonpoint Source Program (NPSP) takes an interactive approach to improving the state's waters that have been degraded or are threatened with degradation from unregulated sources of water pollution. By working with partners such as other state and federal agencies, watershed associations, businesses and all other stakeholders a comprehensive solution to the problems is the goal.

Most of the TMDLs in West Virginia call for most of the pollutant load reductions to come from non-point sources. As such, the S319 funds are being used as a major source of TMDL implementation funding. The NPSP staff, funded under the Base Grant, has devoted much of their efforts towards developing and implementing Incremental Grant projects. The NPSP and related programs, such as the Chesapeake Bay Program and the Stream Partners Program, facilitate the acquiring of additional funds for specific projects. Other funding programs involved with some projects include the Watershed Cooperative Agreement Program and Mining and Reclamation Program with mining mitigation and penalty funds.

The specific pollutants originating from non-point sources are as varied as the land uses. Heavy metals such as iron, aluminum and manganese are common in waters polluted from abandoned coal mining but they also are prevalent in streams affected by heavy sedimentation. Nutrient and bacterial non-point source pollution comes from agriculture and inadequate residential wastewater treatment. Failing septic systems and straight pipe disposal pose public health risks as well as water quality problems in older and rural communities.

West Virginia's NPSP focuses on solving these problems through encouraging, educating and assisting local stakeholders in voluntary correction of non-point source problems. The NPSP is a major component of West Virginia's Watershed Management Framework (WMF) that serves to combine the resources of state and federal agencies along with stakeholder groups to seek restoration of watersheds to water quality standards. Most incremental projects are coordinated through a project team involving all interested stakeholders. Forming partnerships with these other groups is an important component of any successful endeavor. The most successful efforts have been those where local stakeholders have provided the impetus for the projects.

Partners

The Non-point Source Program (NPSP) supports the efforts of three WV state agencies to reduce non-point source pollution from various land use activities; WV Department of Environmental Protection, WV Conservation Agency and the Division of Health and Human Services. The base programs' goals are to:

- Provide technical assistance in the proper installation and maintenance of best management practices (BMPs)
- Educate the public and land users on non-point source issues
- Support citizen based watershed organizations
- Support enforcement of non-point source water quality laws
- Restore impaired watersheds

The partners funded through the S319 Base Program are:

- **The West Virginia Department of Environmental Protection (DEP) Division of Water and Waste Management (DWWM)** is the designated lead agency in the state for the Nonpoint Source Program (NPSP). It is responsible for the administration of the program and reporting requirements including the Grant Reporting Tracking System (GRTS). The management of the NPSP's components is coordinated by the DWWM Program staff. The Program partners with the Watershed Assessment Branch of DWWM for monitoring. The DWWM NPSP also includes the Chesapeake Bay Program (CBP) and the Stream Partners Program (SPP).
- **The West Virginia Conservation Agency (WVCA)** is the lead agency for the construction and agriculture components for the Program. The agriculture component of the nonpoint source program partnership consists of the WVCA, USDA Natural Resources Conservation Service, and the 14 Conservation Districts. The construction component of the nonpoint source program provides technical assistance and education to landowners, contractors, developers, and local governments in West Virginia.
- **The DEP's Office of Oil and Gas (OOG)** is the partner whose role is the promotion of proper best management practice design and installation and maintenance on oil and gas drilling sites and access roads.
- **The Department of Health and Human Services (DHHR)** focuses on the issue of failing septic systems. The S319 funding for this agency was always considered temporary, because of declining Base Grant funds no FY 2008 funding was requested.

Other major partners with the NPSP on incremental grant projects are:

- **The National Mine Lands Reclamation Center (NMLRC)** provides technical assistance and implementation on many of the program's AMD projects.
- **The WVDEP Abandoned Mine Lands Program (AML)** also provides technical assistance and implementation on AMD projects.
- **The WVDEP Division of Mining & Reclamation** consists of four offices including AML, the NPSP works closely with this division in the use of mining mitigation funds.
- **The U.S. Office of Surface Mining (OSM)** is a partner in funding of AMD projects through the Watershed Cooperative Agreement Program (WCAP).
- **The National Resource Conservation Service (NRCS)** is a partner involved in agricultural projects.

- **Citizen Watershed Associations** are the citizen volunteers who provide much needed local support, information and resources.
- **Canaan Valley Institute** provides technical assistance on decentralized wastewater treatment planning and projects.

Nonpoint Source Program Goals for FY 2008

- ❑ To complete FY 04 projects and close the grant.
- ❑ Hold 14 WVSOS regional workshops.
- ❑ Develop at least four EPA approved WBPs .
- ❑ Provide guidance in the development of at least five new project proposals.
- ❑ Update the Oil & Gas BMP Manual.
- ❑ Provide at least 14 nonpoint source educational workshops.

Nonpoint Source Program Mission Statement

To implement dynamic and effective nonpoint source programs to enhance and preserve the physical, chemical and biological integrity of surface and ground waters, considering nature and health, safety, recreation and economic needs of humanity, with a focus on a watershed management approach.

Nonpoint Source Management Plan 2000

Nonpoint source pollution can be caused by a wide range of activities, so the NPSP must remain flexible and delve into a variety of actions. The approach is two-fold, activities designed to educate the public and action on a watershed basis resulting in watershed restoration projects. The base grant supports outreach, education, monitoring, planning, administration and non-TMDL projects. The TMDL implementation projects, project management, planning and monitoring of projects are supported by the incremental grant. The two components complement each other and the intermingling of activities from each occurs often. This has benefited the NPSP by allowing a greater range of activities and projects to be accomplished.

The NPSP supported by the S319 grant, the Chesapeake Bay grant and in part by the S106 grant has 14 full time staff members. The responsibilities of this staff ranges from administration to project planning, implementation and oversight. The NPSP uses a stakeholder process to develop watershed based plans and projects. Project teams often led by or facilitated by the NPSP organize the stakeholders and guide the process. In 2008 there were 32 active major incremental projects in various stages of implementation and six in development. There were also nine minor projects funded from base grant funds as Announcement of Grant Opportunity (AGOs), four WBPs approved and three more in development.

The work done in the Nonpoint Source Program for FY 2008, by category:

Acid Mine Drainage (AMD)

Middle Fork of Greens Run (WVMC-16-A-1) has had older passive treatment systems installed in an attempt to treat this highly toxic drainage, site of the locally infamous Blood Lagoon. Extremely high concentrations of iron (approximately 930 mg/L) within the pit lake give it a deep red color, which when seen from above resembles blood. This project completed in September 2008 is attempting to neutralize the acidity and raise alkalinity and pH precipitating the iron and aluminum and collect the metals before they precipitate into the Middle Fork of Greens Run.


Outlet to Blood Lagoon

The system consists of two large collection ponds for metal retention. A large limestone leach bed was constructed at the present location of the existing open limestone channel. This limestone leach bed will collect and reduce the iron load emanating from the mine water and serve as a collection basin for the iron. The water from the limestone leach bed will then discharge into a series of basins where alkaline loaded water from the steel slag leach pond will mix and thus cause the acidity to be neutralized. A freshwater impoundment was constructed to provide water to the steel slag leach bed. The freshwater will

be contacted with steel slag to further raise its alkalinity. The steel slag leach bed has pipes discharging the alkaline loaded water into collection ponds downstream. Post-construction sampling will begin in the winter for determining results.

Pringle Run (WVMC-27) – Jessop #1 Construction of the Jessop #1 Project is complete. The system consists of a limestone leach bed that collects AMD from two separate portals. A freshwater impoundment collects higher pH water and brings it into contact with steel slag. The water from the leach bed and the steel slag treated water combine in a mixing basin to raise pH and drop metals before the water is released into Pringle Run. This project is the second in a series of planned passive treatment installation aimed at removing Pringle Run from the 303(d) listing of impaired streams. Post-construction sampling will commence when the treatment system is discharging treated water.

Lambert Run (WVMW-16) - Site 5

Lambert Site 5, this summer's drought has reduced the flow into the system.

The Site 5 project was completed in September and is the third project completed in Lambert Run by the NPSP. It consists of an aeration channel to convey the mine water from the portal and into a metal retention pond. From there, the water discharges into a baffled aerobic wetland that lengthens the retention time and allows the metals to drop out. From there, the treated water will then be discharged into Lambert Run. Post-construction sampling will commence once the treatment system is discharging treated water.

Lambert Run (WVMW-16) - Site 9

Extreme levels of aluminum discharging from site 9 before project construction.

The Site 9 project was also completed in September. It consists of a baffled settling basin to catch the initial mine water. This pond has vinyl seawalls that will route the water throughout the pond which will increase the retention time of the vertical flow reactor (VFR) to treat the mine water more efficiently.

Lambert Site 9 was the first NPSP project to use mitigation as a match to 319 funds. A developer needed mitigation credit; to earn that they agreed to construct the site.

Different layers of the vertical flow wetland are visible at Lambert site 9.

A VFR is the major component of treatment in this system. It is designed to handle a maximum of 400 gpm with a retention time of 16 hours. The bed has two components. The first component is an organic substrate which removes oxygen from the effluent and causes the conversion of reduction of iron and sulfates. The second component, a limestone bed, underlies the organic layer and is where the majority of treatment takes place. The limestone is able to neutralize the acidity without the presence of oxygen and does not armor since iron cannot precipitate in anoxic environments. Piping was installed in both the organic layer and limestone layer in an effort to flush any precipitates that may collect in the bed.

At the outfall of the vertical flow reactor, two aerobic wetlands were constructed. The two wetlands combined are approximately 3.5 acres. The first wetland collects the metals as the effluent oxidizes out of the VFR while the second wetland polishes the effluent. Post-construction sampling will commence once the treatment system is discharging treated water.

Kanes Creek (WVM-8-I) – Valley Point #12

Valley Point #12 project during construction.

The project was begun in November 2007 and was completed in September 2008. The project includes a number of features to increase effectiveness and durability. The limestone leachbed is equipped with a solar-powered gate valve, which can be programmed to open and shut at various intervals. The sulfate reducing bioreactor beds can be run in sequence during high flows to maximize treatment. During low flows, the water can be run through either, providing an opportunity to perform maintenance on the other bed. The second retention pond receives any water that is not directed through the bioreactors, so that any water that remains acidic can be mixed with the neutralized water from the bioreactors. The water level in the sulfate reducing bioreactor beds and in the first retention pond can be controlled by raising or lowering panels in a

Preparing solar panel for automated outlet control.

drainage structure. Finally, the bioreactors are sealed on the top as well as on the bottom, and then covered with topsoil and vegetation, so that the surface appears relatively undisturbed. The project was completed during a dry period, and is gradually filling up with water.

Kanes Creek (WVM-8-I) – Valley Highwall #3 and Kanes Creek South Projects

The Kanes Creek South Site #1 (KCS1) and Valley Highwall #3 (VH3) projects are in the process of being transformed from passive treatment to active treatment projects. This recommendation came from the engineering company designing the system because it uses less land from cooperating landowners and the treatment will be more dependable at high flows.

The Friends of Deckers Creek (FODC) is conducting the deposition experiments recommended by USEPA. One concern was the impact of precipitating metals on the mainstem of Kanes Creek. FODC attempted to treat the KCS1 drainage first by treating the discharge bucket by bucket but the length of stream which was actually treated was only a small portion of the reach that needs to be treated. Lime Dosers Consultants, LLC offered to lend a portable doser to complete the test, which will be conducted in the winter.

North Fork of the Blackwater River, Long Run (WVMC-60-3-A) – Albert Highwall

The Abandoned Mine Land Program (AML) repaired the damaged section of the 19' Fabriform channel with grouted riprap and installed eight steel slag filled gabion baskets in the lower reaches of the undamaged section of this same channel for water treatment. AML excavated the existing substrate from the cell, repaired the breached embankment, installed 462l ft of new perforated outlet piping and refilled the cell with Steel Slag. They constructed a 42l ft Open Channel Spillway for the cell and installed 60f of 18 inch road crossing culvert, 410 ft of 6 inch grouted limestone riprap channel and 113 ft of open limestone riprap channel to convey drainage from this system to Long Run. The contractor then installed the Agridrain Smart Valve.

Limestone check dams coming from the Albert Highwall treatment systems.

The existing flow of AMD which had been diverted around the cell since before construction was very low at this point and after it was again induced into the cell only filled to a level of approximately ½ full. No water quality data has been collected from the discharge point. Some treatment is being provided directly into Long Run by the Slag-filled Gabion Baskets in the 19 ft Fabriform Channel.

Agriculture

Lost River I (WVPC-24)

This project has been in the works for over three years. In September 2008 the land rights were acquired for both landowners involved in the project. On September 22, 2008 construction began at the site. The first week involved site preparation, constructing the floodplains adjacent to the stream and sloping the stream banks. The following week the large rocks were delivered. Construction of the rock structures began the third week and lasted a total of three weeks. Seeding and mulching of the site followed the completion of the project. All disturbed areas were seeded & mulched.

The project stabilized and protected 1500 linear feet of stream banks involving 10.5 acres. The estimated reduction of sediment after vegetation is established is 3387 tons/year.

The landowner is in the process of talking to Farm Service Administration to sign-up for Conservation Reserve Enhancement Program (CREP) for this land and plans on planting trees to ensure vegetation is established.

***The WV Conservation Agency**, as a part of the agency's actions in support of conservation practices for agriculture and supported in part by the 319 base grant, developed nutrient management plans for proper nitrogen application on 1309 acres. The estimated load reductions from these plans are 37.5 tons/year of nitrogen and 33.3 tons/year of phosphorus. Conservation plans developed under Farm Bill programs on 974 acres are expected to achieve a 2.51 tons/year reduction of sediment.*

Part of the Lost River project area before the project (left) and after construction (right).

Kitchen Creek of Muddy Creek

In the Greenbrier Valley community of Blue Sulphur Springs, a new riparian demonstration project has been developed to educate farmers on techniques that can be utilized to prevent streambanks from eroding pasture land. Utilizing the CREP, the Partners for Fish and Wildlife Program, and 319 water quality funding, a local farmer was able to stabilize his streambank, fence livestock out of the stream, develop a stable access point to the stream, drill a well, and develop an alternative livestock watering system.

Conservation planning assistance was provided by the WVCA and the NRCS. The streambank stabilization structures were designed by the WVCA and constructed by the Southern Conservation District crew. Plant materials including dwarf bankers willow cuttings and Bermuda grass sprigs to provide root structure were provided by the NRCS Appalachian Plant Materials Center. The U.S. Fish and Wildlife Service and Trout Unlimited provided the fence building crew and fencing materials to create the riparian buffer.

This site demonstrates how different state and federal cost share programs can be worked together to achieve multiple goals for the conservation of natural resources. As the project continues to develop, it will be used for conservation district agricultural field days and other educational functions.

Monitoring

The West Virginia Save Our Streams (WVSOS)
In an attempt to reduce travel and print costs and provide better statewide coverage the program has undergone some changes in 2008. The reorganization efforts have resulted in fewer workshops; however follow-up opportunities have dramatically improved and other outreach efforts such as projects and training opportunities have increased dramatically. The program served 442 more participants compared to the same period last year.

Total number of events including workshops and presentations during this period were 36 with 2056 people attending. The program continues to be actively involved in a variety of special projects and programs. Most of these are project based, some of

WVSOS partnered with the Kanawha Valley Chapter of Trout Unlimited to study the impacts of a diesel spill in Elkhorn Creek that occurred in 2007. A team of volunteers from the chapter along with WVSOS and other NPSP staff have visited the study sites twice. Thus far the impacted areas below the spill have been very slow to recover, with only a gradual increase in metrics from fall to spring. However the recovery site further downstream from the spill declined in numbers and diversity. The team observed increased embeddedness and sedimentation.

which are paid for in part by 319 grant funds. A brief summary of each that occurred within the period is provided below:

Potomac Stream Samplers: The program uses WVSOS standard operating procedures to engage teachers and students in inquiry-based outdoor science program. Along with the teachers and students, this project involves community watershed organizations and The Mountain Institute. The program expanded into the southern coalfields in 2008.

Spring Run Project: This is an on-going monitoring project studying the impacts of hatchery effluents on a free-stone stream. During the project, funds became available to upgrade the hatchery treatment systems resulting in much lower nitrogen/phosphorous releases. Since the upgrades were completed, water chemistries have improved, there is a dramatic improvement in the physical conditions downstream; the abundant algae and strong odors have subsided and qualitative assessments of the benthics show gradual improvement.

Northfork of Elkhorn Creek Project: WVSOS assisted in completing monitoring prior to the installation of an alternative wastewater system for a small community in McDowell County. More than 200,000 fecal coliform per 100 ml were detected at the project site and less than 200 upstream.

Morris Creek Study

During 2008 several rounds of samples were collected within the Morris Creek watershed by Western Basin Coordinator Taryn Murray, intern Adam Buckley, and members of the Morris Creek Watershed Association. There were two goals in mind. First was to assesses and analyze the water quality in main stem Morris and its tributaries. The second objective was to determine the precision of a LaMotte Monitoring Field kit when compared to lab analysis. No statistics are currently available on the test kit study. Of the four main treatment systems it was found that the Upper Mainstem, Lower Mainstem, and Blacksnake Hollow treatment systems had effluents with chemistry outside of water quality standards for pH, total iron, and dissolved aluminum. In addition, it was also determined that the Upper Mainstem site is the number one contributor of AMD and the Lower Mainstem site second.

It was found that Morris Creek did not meet water quality standards downstream of the Upper and Lower Mainstem sites. (Appendix A-9) This equates to around 1.14 miles of Morris Creek that is currently not meeting water quality standards. In addition to these sites, two untreated AMD seeps, and one tributary were sampled. Neither seep was found to have any impact on the water quality of Morris Creek. The tributary, Schuyler Fork, was found to be outside of water quality standards at its mouth. Though further sampling is needed, it appears that a seep near the mouth of Schuyler was mainly responsible for these impacts.

Monitoring the Lower Cheat

The Friends of the Cheat (FOC) has received a 319 grant to support their monitoring efforts in the Lower Cheat River as part of the major effort to restore that section of the watershed. The goals of this monitoring program are to assess the results of the many projects being installed and locate unknown sources of AMD. During 2008 FOC has completed post construction monitoring of the Morgan Run DeAntonis site, pre-construction monitoring on Jessop Portals/Pringle Run, South Fork of Greens/Sanders site, Middle Fork Greens/Blood Lagoon site, drainage basin assessment of all sources on Pringle Run, Sovern Run monitoring of passive projects and assessment of stream recovery and reconnaissance on Bull Run.

Results obtained so far show that the Morgan Run site is still functioning with a 95% reduction in acid. Continued monitoring of the project will evaluate a vertical flow slag leach bed for longevity in alkaline production.

South Fork of Greens Run has undergone pre-monitoring sampling and FOC has collected and compiled data from 2005 to 2008.

Monitoring Glade Run

Another significant monitoring area is Pringle Run and all known data has been compiled. Camp Dawson controls the lower half of Pringle Run within a West Virginia National Guard Training area. AML has expressed a willingness to partner into funding with Camp Dawson for a lime doser on Pringle Run. FOC provided data and mapping to assist with necessary decisions. With concerns about precipitating metals in the stream and Cheat River mainstem, this data made possible the determination that a site on one of two headwater forks of Pringle Run could significantly reduce acid load without significant negative impact on lower reaches. The final determination of the doser site and performance goal has not yet been reached.

FOC continues monitoring, treatment, and assessment on Sovern Run. The field measurements taken indicate immediate improvement in pH and electric conductivity. On April 7th, the measurements above the site were 3.9 pH and 300 EC while pH below the site was 4.8 and the EC was 200. These projects have improved water quality in Sovern but data indicates it is still below the biological threshold of supporting aquatic life. One result of the monitoring and a contact from a landowner was the discovery of a new source on Sovern Run. This site has multiple seeps with low pH. It is anticipated that a passive treatment project on this property will take Sovern of off the DEP 303(d) list.

Monitoring of Deckers Creek

The Friends of Deckers Creek (FODC) received a small AGO grant from the NPSP for monitoring. They took 55 monitoring trips to quantify acid mine drainage , to assess the health of the creek and its tributaries and to assess the performance of past projects. On one final trip, we submitted split samples to three different laboratories to test their consistency. In all, 268 water samples were tested. The effort was possible because of volunteers contributing 234 hours to this monitoring work.

The major significance of the monitoring data was it helped to determine acid mine drainage loads at several sites.

- *Sandy Run of Kanes Creek* the pH averaged 5.6, although one measurement was as low as 3.8.
- *Kanes Creek South Site #3 and the Morgan Mine Road AMD site* contribute acidity loads that are similar in size to those of Sandy Run.
- *Laurel Run* had a pH value averaging near 6.3. However, between the road and its mouth on Deckers Creek it receives the waters of the Burke Road Mine Drain, which adds the majority of acidity and metals to the creek.
- *Dillan Creek* is where a recent project by the Natural Resources Conservation Service (NRCS) diverted a stream that had previously run through a spoil pile and became acidic. pH values were near 5 at the Dillan Diversion and near 4 at the mainstem on the road.

Outreach and Education


State Conservation Camp

WVCA Watershed Resource Center

Activities have been focused in the eastern panhandle to teach local elementary students about the concerns of the Chesapeake Bay. One thousand students from Morgan and Jefferson Counties participated in an educational event. Working with the Jefferson County Watershed Coalition a 4 acre riparian buffer was planted at Morgan Grove Park in Shepherdstown. The 550 tree planting was a huge success, with over 80 participants attending. The Chesapeake Bay Foundation is partnering with the local agencies to assist in future plantings.

The WVCA organized and conducted other education and outreach activities, including:

- Stream ecology workshops: 305 participants
- NPS programs: 44 participants
- Rain Barrels: 60 participants, 3 workshops
- SOS: 40 participants
- Sediment & Erosion workshops: 57 participants
- Soil Conservation presentations: 600 participants, 4 workshops
- Agriculture & Conservation in elementary schools: 503 participants

WVCA teaches riparian tree planting at a CREP workshop

Seen and Unseen, Water in a Karst Area – Greenbrier River Watershed Association

An AGO grant awarded to the Greenbrier River Watershed Association (GRWA) was used in a variety of ongoing and new programs in Greenbrier, Monroe, Pocahontas and Summers counties in West Virginia. The focus of the project was community education relating to the special nature of the karst topography that underlies most of the Greenbrier River Valley. The education described steps people can take to clean up the river and the role that karst topography plays in the difficulty of tracking pollutants. The hope was people would be able to make the connections between what is seen above ground and what lies beneath.

GRWA updated and reprinted their Protection Guide to the Greenbrier River and are using it as their main educational piece. The Guide focuses on what citizens can do to make their water supply safe for drinking and recreation and gives them contact information to get in touch with agencies when they have questions or concerns about whether a practice is environmentally sound.

GRWA partnered with Art in the Park and the Greenbrier River Trail Association as well as the city of Lewisburg and Pocahontas County Convention and Visitors Bureau to make a large two-sided 3X5 sign for a riverfront park in Caldwell.

The GRWA assisted in teaching a "NPS" class by demonstrating how to ID the different types of land impact. Partnered through an education grant with Lost World Caverns the cave was used in a 4-day environmental class with 600 middle schoolers and 12 adults. Eastern Greenbrier Middle School has partnered with GRWA for environmental service-learning for 2 class periods a week on how 6th and 7th graders can take their environmental training and work to solve the problems their world faces.

Planning

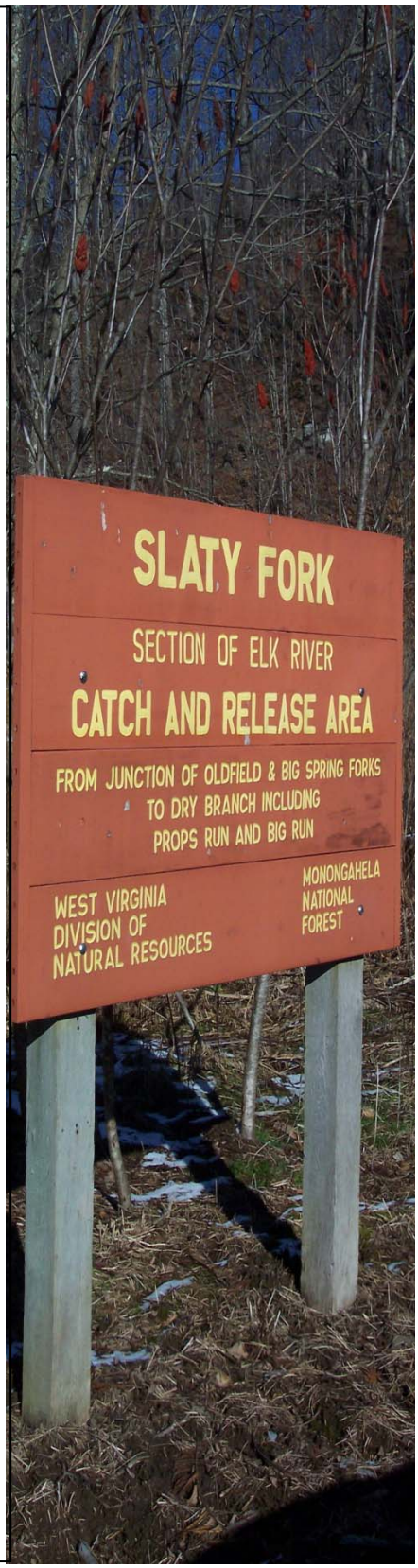
In FY 2008 four watershed based plans (WBPs) were completed, submitted and approved. They were for Martin Creek, Sleepy Creek, Mill Creek of Opequon and Mill Creek of the South Branch Potomac. The Second Creek WBP was submitted and is awaiting approval by EPA.

The Upper Elk Watershed Protection Plan

The newest and most innovative planning project for the NPSP has started in the Upper Elk River watershed. This high quality watershed is home to two trout catch and release sections but is under heavy pressure from development. The Snowshoe Resort is in the headwaters of the watershed. A controversial plan for a regional sewage treatment plant brought water quality issues and concerns for the future of the watershed into public debate. The NPSP provided the Elk Headwaters Watershed Association (EHWA) a 319 planning grant to start the process of developing a watershed protection plan.

The EHWA hired Downstream Strategies to facilitate a project team. They have compiled existing data and information regarding the Elk Headwaters from numerous sources, including WVDEP, the West Virginia Division of Natural Resources, West Virginia University, Trout Unlimited, the Elk Headwaters Watershed Association, and Eight Rivers Safe Development. In September, a draft State of the Watershed Report was shared with local stakeholders and feedback is now being provided. Downstream Strategies will incorporate feedback and prepare a final report in October 2008.

Meanwhile, project partners have been seeking matching funds. A $10,000 grant was secured from National Audubon Society's Together Green program. This grant will fund a series of meetings in late 2008 and early 2009, which will allow local stakeholders to develop a joint vision for the watershed. Additional funding is being sought for an expanded State of the Watershed Report and for the final, full Comprehensive Watershed Plan.



Silviculture

Mulch Alternatives on Skid Road Restoration

West Virginia University (WVU) School of Forestry received a 319 grant to research the effectiveness of mulching logging roads. High quality hardwood forests surround the Upper Elk River watershed, covering approximately 95% of the area with a high percentage of land in timber production. The steep slopes of the watershed are traversed with truck and skid roads are often a primary nonpoint source of sediment that can impact the water quality in the Upper Elk River. The most common practice used to limit sedimentation is the use of seed and mulch material to cover disturbed soil locations and establish vegetative cover as quickly as possible. A number of different treatments were applied to skid roads in order to quantify the efficiency and effectiveness of the methods. These results can assist in the decision making process to select the most appropriate treatment for the individual skid road site. The specific objectives of this study were to 1.) Establish soil erosion plots and characterize the load from each treatment method and 2.) Estimate the time required for each treatment method.

Eight skid road sections were instrumented with DOT grade silt fencing along the lowest cross section of the road. WVU found no significant difference in sediments collected from skid roads that were treated with the hand applied straw and seed, hand applied PAM-12 and seed, or the hydromulcher applied PAM-12. Sediments collected on skid roads that were treated with the traditional straw and seed or either of the PAM-12 treatments *were significantly lower than those that were treated with the hydromulch paper and seed.*

Stream Bank Restoration

Burroughs Run (WVM-3)

The Burroughs and Poponoe Runs Watershed Project is part of a large urban stormwater management project for the city of Morgantown. The stream bank stabilization of Burroughs Run through Morgantown was the first urban project funded by a 319 incremental grant. Work on the Burroughs Run Stream restoration portion of this project is nearing completion. To date, approximately 3900 feet of the total 4700 feet of stream work in Burroughs Run is actively in service.

Stabilized stream banks in Burroughs Run

The stabilization of the Burroughs Run stream has taken the form of several construction techniques including natural stream restoration and some “hard”, more traditional methods. The maturation of the plants in the 10 month range has already begun to take on a very

natural appearance.

Nonstructural practices employed in the watersheds have already been implemented to a large degree. These include implementation of construction site erosion and post construction stormwater management performance standards on new development, public involvement including meetings with watershed stakeholders, and public education and outreach through informational leaflets and information on the Morgantown Utility Board website.

Twelve Mile Creek Restoration (WVMC-54-K)

The Horseshoe Run Watershed Association received a 319 AGO grant for restoring a segment of a native trout stream in a very remote part of their watershed that had been impacted by a logging job in the mid-1990s. The result of that activity led to the stream's diversion and a new channel being cut down the road, which previously formed the stream, rendering it impassable and dewatering approximately 1000 feet of native trout stream. The new channel progressively incised the road resulting in a gulley 335 feet long, as much as 7 feet deep and a bottom width up to 7 feet wide. An estimated 1,500 tons of road bed material were displaced and a nearly linear, unstable stream with a habitat nearly worthless for fish and other aquatic organisms formed.

Construction began in September with support of the Tygarts Valley Conservation District and the project's implementation moved quickly and was completed in less than 4 days. The new stream was cut and a berm constructed to divert the stream flow to it using native materials and downed trees. Then the site was stabilized with a native plant mix for quick vegetative cover and mulched.

Additional work was done on the stream corridor above the site removing blockages caused by fallen timber and debris accumulations. A berm was constructed along one part of the road to keep the stream from entering the road which was eroding severely and bringing additional sediment to the stream. One highly eroded stream bank area that off road vehicles were using was stabilized and made impassable, eliminating another sediment source.

The site will be monitored and biological assessments done to measure the reach recovery resulting from the project implementation.

Urban

ReStore Rain Garden

The Habitat for Humanity ReStore received a FY 04 319 AGO grant to develop a rain garden in the parking lot of their store in Charleston. Completed in June 2008 the garden is 41' x 17' for a total of 697 square feet. It serves as the primary storm water runoff spot for the 1,000 square foot paved parking lot.

The Mayor of Charleston dedicated the rain garden in a ceremony held at the ReStore on June 11, 2008. Being the first rain garden in Charleston, it was covered by the local media through television and print. Since the dedication, other local businesses and nonprofits have expressed an interest in creating rain gardens in various locations around Charleston.

Throughout the summer, most of the plants have thrived and local volunteer groups have helped maintain the garden. Educational information about rain gardens remains on display at the ReStore and community groups continue to visit the garden to learn about the environmental benefits.

Amy McLaughin (left) of Habitat for Humanity and Taryn Murray (right) of DEP explain the ReStore rain garden project during the Watershed Celebration Day tour.

Baltimore Street Rain Garden Demonstration

Another AGO grant for a demonstration rain garden was given to the Opequon Creek Project Team (OCPT). A 1,470 sq. ft rain garden was installed in the parking area of the Kilmer Springs water filtration plant in spring 2008. It is long and linear (10' x 147') and parallels Baltimore Street. The area that drains toward this new stormwater management structure includes approximately three acres of street surface, small parking lots, and residential lots.

Before and after, the Baltimore St. rain garden

The OCPT brought partners together to complete this demonstration project. VIEW Engineering discounted their design services for the project. The City of Martinsburg provided in-kind match by helping with site selection, constructing the entire structure, and periodically weeding and watering it after planting. The OCPT selected and ordered native plants, shrubs, and trees. OCPT, Berkeley and Jefferson County Master Gardeners and Girl Scout Troop 442 planted and mulched the garden in May 2008.

Additional elements of this project included an informative project sign and a "how-to" video, using footage from this project's construction. A near-final draft of the video is posted at www.youtube.com/watch?v=6Y_-nP4bFns .

Wastewater Treatment

SMART Approach for Wastewater Solutions

An AGO to WVU's National Environmental Services Center (NESC) provided funding for a workshop for teaching wastewater solutions held on September 18 – 19, 2008. Fifteen participants from watershed associations, regional planning and development councils, conservation agencies, DEP and engineering firms attended the workshop. The workshop trainers included a state sewage program director, an EPA wastewater project director, an environmental engineer and a DEP funding official. The participants learned how to assess community needs and resources, understand state regulatory requirements, choose appropriate wastewater technology and ensure system viability. In the evaluations participants indicated their intent to use what they learned to evaluate water quality issues and develop watershed plans to address fecal TMDLs.

Ashland Community Wastewater Treatment Project (WVBST-99-L-4)

Volunteers from Duke University dig the drain field for the Ashland project.

Advances have been made regarding the implementation of this 319 incremental project. West Virginia Ministry of Advocacy and Workcamps provided volunteers to help construct the drain field. Some of the student volunteers were from Duke University in an Appalachian Studies class and came to learn about the struggles in WV Appalachia as well as help. The volunteer labor has helped to reduce the overall cost of the project. The project is currently out to bid. The Wastewater Treatment Coalition of McDowell County (WTCMC) is creating a relationship with the citizens of Crumpler. A few members of the WTCMC and the local residents of Crumpler who manage the water supply, met in Ashland to discuss partnering to create a wastewater system for the Crumpler community, the next priority in the North Fork of Elkhorn Creek WBP.

★★★★★★★★★★

The projects listed in this section are those who had major accomplishments in FY 2008. The NPSP staff and partners have made efforts in 38 incremental projects, 9 AGO projects and the development of seven WBPs in 2008.

★★★★★★★★★★

There are four major issues looming on the horizon that could impact the NPSP in 2009 and beyond:

1. A new administration and its direction and available funding
2. Mitigation funding
3. AMD treatment options
4. Marcellus Shale

The direction the Obama administration takes regarding nonpoint source programs and the level of funding are issues beyond the influence of WV's NPSP. Adjustments will be made as they become necessary. However in the other three areas the NPSP is working with partners to establish workable systems for dealing with these issues.

Unfortunately economic activities such as development and mining can destroy or severely alter streams. When that occurs the company must mitigate for that damage. Taking advantage of that, the NPSP was able to use a developer's mitigation for constructing one of its AMD projects. The potential is that tens of millions of dollars will become available from mitigation and penalties that can be used to restore impaired streams. The NPSP's watershed based plans already have millions of dollars worth of projects identified (Appendix A-5). However these plans may not be located in watersheds where the mitigation is required. The DEP will be focusing on developing watershed plans (not WBPs) for most of the watersheds in the state.

Mitigation funding could be critical to the success of 319 funded projects. Prior to 2003 little 319 funding went to AMD because there were few matching funds available. When the WCAP funding became available as match AMD became a main focus of the program. At that time the only limit of WCAP was a 40% cap, which matched perfectly with the 319's 60%. During that period large projects in the Cheat and Morris Creek were constructed. Then two years ago WCAP had a 40% or $100,000 cap. This meant that only $150,000 of 319 could be requested without additional match sources. The latest information indicates that the WCAP match may be decreased to 28%. If this happens then it will be difficult to fund many of the NPSP's WBPs. Large projects will require the development of funding partnerships involving multiple funding sources as was done in Morris Creek with 319, AML and WCAP contributing to the project. This will make funding planning more complicated but will spread the cost of projects over several sources.

Mitigation funds can also be directed at non-AMD treatment projects. They are already being used in stream habitat improvement projects and discussions have been had about supporting on-site wastewater treatment projects.

AMD treatment by the NPSP has always involved passive treatment systems because of the operations and maintenance requirements of active systems. A WVU study commissioned by AML concluded that the active treatment of in-stream dosing was more cost effective than other treatment options. These results were presented to a newly formed AML Advisory Committee, comprised of AML, NPSP, Mining and Reclamation, Department of Natural Resources, Trout Unlimited and watershed associations. Three watersheds were selected to try in-stream dosing: Abrams Creek, Paint Creek and Three Forks Creek. The focus of these projects is the restoration of fishable stream miles and reconnecting stranded populations of brook trout.

One serious concern is that metals will drop out of solution in the stream. Certain sections of the stream will be smothered and not achieve biological recovery. This strategy is in conflict with the goals of NPSP goals of complete restoration and removal of the stream from the 303(d) list. The results of these pilot projects will guide the decisions of the Committee in the future. At this time the Friends of Deckers Creek are experimenting with in-stream dosing at a site approved for a passive system with 319 funding. It was determined that the passive system designed would not adequately treat this small but significant source so this experiment is intended to guide the decision regarding an acceptable revision of the grant. These experiments may result in a significant change in NPSP strategy.

In West Virginia's steep terrain oil and gas roads and wells become a significant source of sedimentation. Especially in vulnerable headwater streams, the excess sediment leads to stream bank erosion and loss of aquatic habitat and life. The roads become avenues for ATV use, keeping the dirt roads in a constant state of disrepair and erodible. Now a possibly more serious problem is coming into the state, gas drilling in Marcellus Shale. Marcellus Shale is a deep layer of shale, in some areas more than a mile underground. This layer is rich in natural gas, which is in high demand in today's economy.

To get the gas a company must drill into the layer and then fracture it by pumping water under high pressure into this rock stratum. This requires tens of thousands of gallons of water usually drawn from local streams. Then after fracturing the water is extracted so gas can then be pumped out. The two primary environmental concerns are dewatering streams and treating the water after use before discharging back into a stream. In addition, because the roads used will have more traffic of larger and heavier equipment the potential for nonpoint source pollution is significantly greater than with ordinary gas drilling.

During 2008 the NPSP has been working with DEP's Office of Oil and Gas to produce an upgrade to the BMP manual for the industry. A final draft for review and approval should be ready in January 2009. In the meantime the NPSP continues to raise the issue of nonpoint source pollution from oil and gas operations and the potentially greater problem with Marcellus Shale operations.

In 2009 the NPSP will continue to become a significant partner with other agencies because of its special areas of expertise and the available WBPs that the program has supported and produced. A new Announcement of Grant Opportunity will be issued to increase the availability of funds for important projects that are not eligible for incremental funding. AGOs have become popular with organizations trying to focus on nonpoint source pollution and it has made many more people aware of the NPSP and the mission it supports.

The goals of the Nonpoint Source Program for 2009 are:

1. ***Complete all FY 2005 projects. This will include the first major community cluster wastewater treatment system.***
2. ***Gain approval of four more watershed based plans including two in the Greenbrier watershed.***
3. ***Conduct 14 WVSOS regional workshops for volunteer monitoring and organize 4 agriculture educational field days.***
4. ***Host the 2009 Region 3 State's NP, TMDL, Water Quality Standards and Watershed Assessment Meeting to be held in May 2009.***
5. ***Submit at least five new incremental project proposals for FY 2010.***
6. ***Issue another Announcement of Grant Opportunity.***

Appendix

WEST VIRGINIA

NON-POINT SOURCE PROGRAM

GRANT FUNDS: 319(h)

BUDGET PERIOD FY 2008

OCTOBER 1, 2007 THROUGH SEPTEMBER 30, 2008

BASE PROGRAM	FEDERAL	STATE	TOTAL
WV DEP			
WATER & WASTE MANAGEMENT	**$633,100**	**$421,734**	**$1,054,834**
OIL & GAS	**$60,000**	**$40,000**	**$100,000**
WV CONSERVATION AGENCY	**$325,000**	**$217,000**	**$542,000**
TOTALS	**$1,018,100**	**$678,734**	**$1,696,834**

INCREMENTAL PROGRAM			
MORGAN MINE & KANES CREEK 3	**$300,000**	**$210,000**	**$510,000**
SMOOTH ROCK LICK #1 & #2	**$122,930**	**$81,954**	**$204,884**
WATERSHED BASED PLANS	**$40,000**	**$26.667**	**$66,667**
TOTALS	**$462,930**	**$318,621**	**$781,551**

WEST VIRGINIA

NON-POINT SOURCE PROGRAM

GRANT FUNDS: 319(h)

BUDGET PERIOD FY 2008

OCTOBER 1, 2007 THROUGH SEPTEMBER 30, 2008

ADMENDMENT TO FY 2008 GRANT

BASE PROGRAM	FEDERAL	STATE	TOTAL
REGION 3 NPS, WQS, TMDL	$20,000	$13,334	$33,334
CONFERENCE DWWM ADMENDMENT	$6,300	$4,200	$10,500
BASE TOTALS	$26,300	$17,534	$43,834
INCREMENTAL PROGRAM			
UPPER MUDDY CREEK AMD	$115,521	$77,014	$192,535
NORTH FORK GREENS RUN	$150,000	$100,000	$250,000
PRINGLE RUN AMD	$150,000	$100,000	$250,000
SLEEPY CREEK	$292,552	$195,035	$487,587
INCREMENTAL TOTALS	$708,073	$472,049	$1,180,122
ADMENDMENT TOTALS	$734,373	$489,583	$1,223,956

Active Nonpoint Source Program Projects in FY 2008

Project	FY	Primary Category	$319	Status
Valley Point #12	2004	AMD	$126,196	Completed
Oldaker	2004	AMD	$144,000	Completed
Site 5	2004	AMD	$146,334	Completed
Lamberts (remaining)	2004	AMD	$278,666	Completed
Muzzleloader	2004	AMD	$106,663	Completed
Cheat 3	2004	AMD	$371,217	Completed
Monitoring	2004	Monitoring	$36,000	Completed
McDowell	2005	Septics	$231,650	On Schedule
MUB (Burroughs Run)	2005	Stream banks	$250,000	On Schedule
SF Greens Run	2005	AMD	$61,576	Planning
Muddy Creek	2005	AMD	$288,391	Planning
Morris Creek Phase I	2005	Stream banks	$41,139	Completed
N.F. Elkhorn OSP	2005	Septics	$82,500	Planning
Morris Creek Phase II	2006	Stream banks	$181,600	Planning
Kanes Creek South	2006	AMD	$237,694	Planning
Lost River	2006	Agriculture	$215,682	On Schedule
Watershed Planning	2006	Planning	$40,000	Completed
Little Sandy Assessment	2006	Planning	$120,000	Not Started
Pecks Run	2006	Septics	$11,750	Completed
Smooth Rock Lick #1	2007	AMD	$64,401	Not Started
Lost River 2	2007	Agriculture	$452,604	On Schedule
Sandy Run/Kanes Ck	2007	AMD	$298,925	On Schedule
Ury Wastewater	2007	Septics	$136,000	On Schedule
Raccoon Creek	2007	AMD	$88,530	Not Started
Albert Highwall	2007	AMD	$62,050	Completed
Losing Ground	2007	Outreach	$37,000	Not Started
Morgan Mine Rd	2008	AMD	$300,000	Not Started
Smooth Rock Lick #2	2008	AMD	$122,930	Not Started
Muddy Creek	2008	AMD	$115,521	Not Started
N. F. Greens Run	2008	AMD	$150,000	Not Started
Pringle Run	2008	AMD	$150,000	Not Started
Sleepy Creek	2008	Septics	$292,552	Not Started
Totals			$5,241,571	

2008 AGO Projects

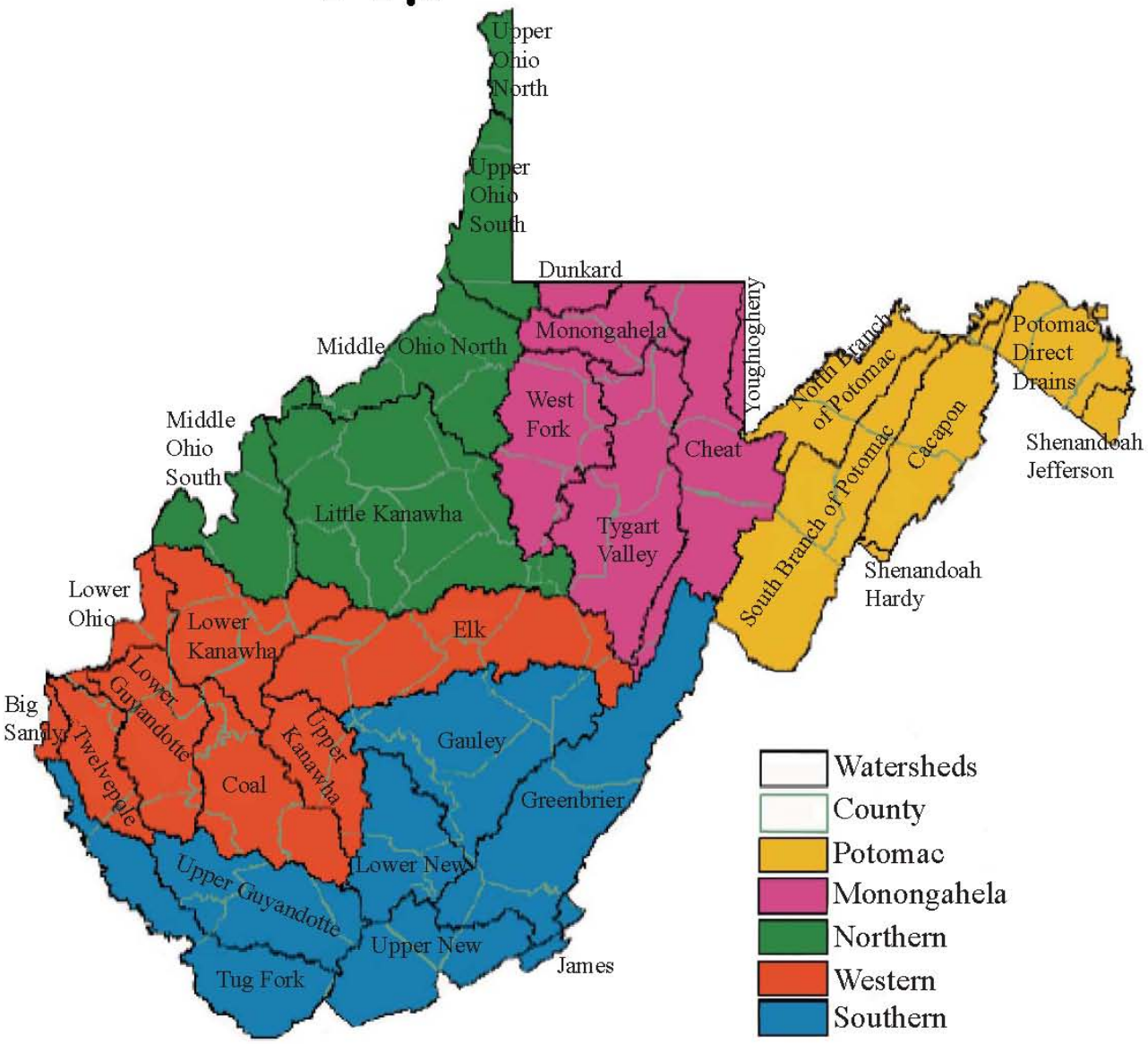
Project	*Grantee*	*319 $*	*Match*	*Status*
Doodlebugs Wetland Restoration	Eastern Panhandle CD	$11,992	$7,995	Revised
Decentralized Wastewater Solutions	National Environmental Services Ctr	$27,972	$19,029	Completed
McDowell Outdoor Classroom	McDowell County Wastewater Coalition	$11,130	$13,000	Completed
Monitoring NPS	Friends of Deckers Creek	$13,200	$8,800	On Schedule
Mulch & Alternatives on Skid Roads	WVU Appalachian Hardwood Ctr	$35,000	$23,334	Completed
ReStore Rain Garden	Habitat for Humanity	$5,917	$4,010	Completed
Twelve Mile Restoration	Horseshoe Run Watershed Assoc.	$20,105	$13,404	Completed
Water in a Karst Area	Greenbrier River Watershed Assoc.	$10,000	$6,666	Completed
Urban Stormwater Demonstration	Opequon Creek Project Team	$20,000	$13,334	Completed
Total		$155,316	$109,572	$264,888

Watershed Based Plans Cost Estimates						
ID	***Watershed***	***Year Approved***	***Pollution Sources***	***319 Funds***	***Match Needed***	***Total Projected Costs***
1	Martin Creek	2008	Septics	$238,680	$189,120	$427,800
2	Mill Cr Opequon	2008	Septics, Streambanks	$3,195,592	$2,130,394	$5,325,986
3	Mill Cr South Branch	2008	Agriculture	$558,900	$372,600	$931,500
4	Sleepy Creek	2008	Septics, Streambanks	$2,879,406	$1,919,604	$4,799,010
5	N. F. Elkhorn Ck	2007	Septics	$2,878,248	$1,918,832	$4,797,080
6	Upper Guyandotte	2006	Septics	$5,940,000	$3,960,000	$9,900,000
7	Burroughs Run	2005	Urban, Streambanks	$250,000	$2,601,760	$2,851,760
8	N. F. Blackwater R.	2005	AMD	$3,312,000	$2,208,000	$5,520,000
9	Three Forks Ck.	2005	AMD	$4,428,000	$2,952,000	$7,380,000
10	Lost River	2005	Agriculture, Streambanks	$787,308	$524,872	$1,312,180
11	Lower Cheat R.	2005	AMD	$12,954,000	$8,636,000	$21,590,000
12	Deckers Creek	2005	AMD	$3,540,000	$2,360,000	$5,900,000
13	Lamberts Run	2004	AMD	$867,000	$833,000	$1,700,000
14	Morris Creek	2004	AMD	$1,200,000	$800,000	$2,000,000
15	Lower Elk R.	2004	Roads, Streambanks	$938,312	$625,540	$1,563,852
16	Upper Buckhannon	2004	Mixed	$1,290,000	$860,120	$2,150,120
17	Finks Run	2004	Mixed	$257,782	$171,856	$429,638
18	Pecks Run	2004	Mixed	$211,443	$140,953	$352,396
19	Second Creek	Not approved	Agriculture	$765,792	$510,527	$1,276,319
20	West Run	Not submitted	Urban			
21	Upper Elk R.	Not submitted	Development, Septics			
22	Mountwood Lake	Not submitted	Streambanks			
	Total WBP Implementation Estimate			**$46,492,463**	**$33,715,178**	**$80,207,641**

This represents the estimated costs of WBP implementation and has not taken into account projects already implemented.

West Virginia Stream Partners and Nonpoint Source Program Regional Divisions

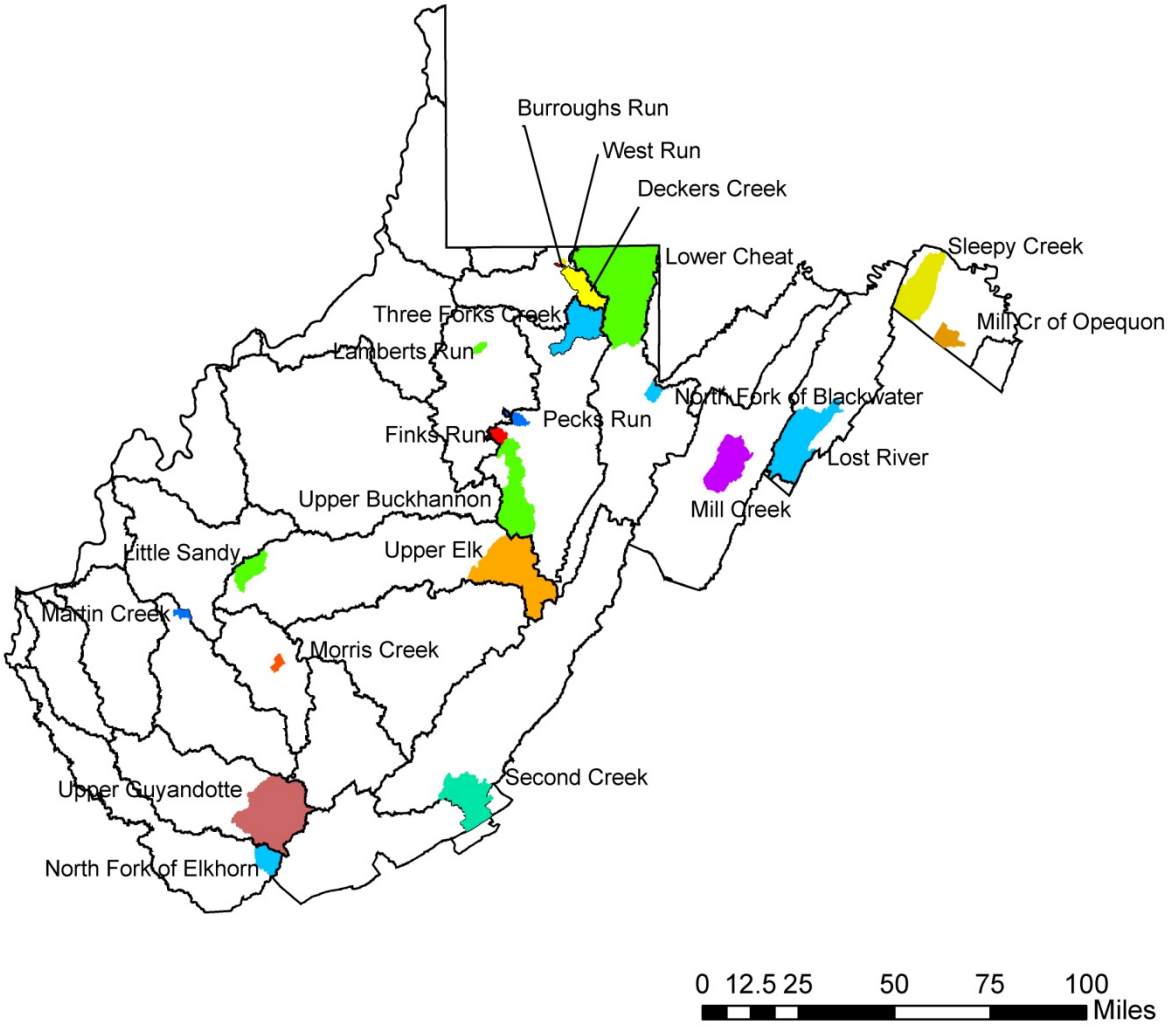
west virginia dep department of environmental protection



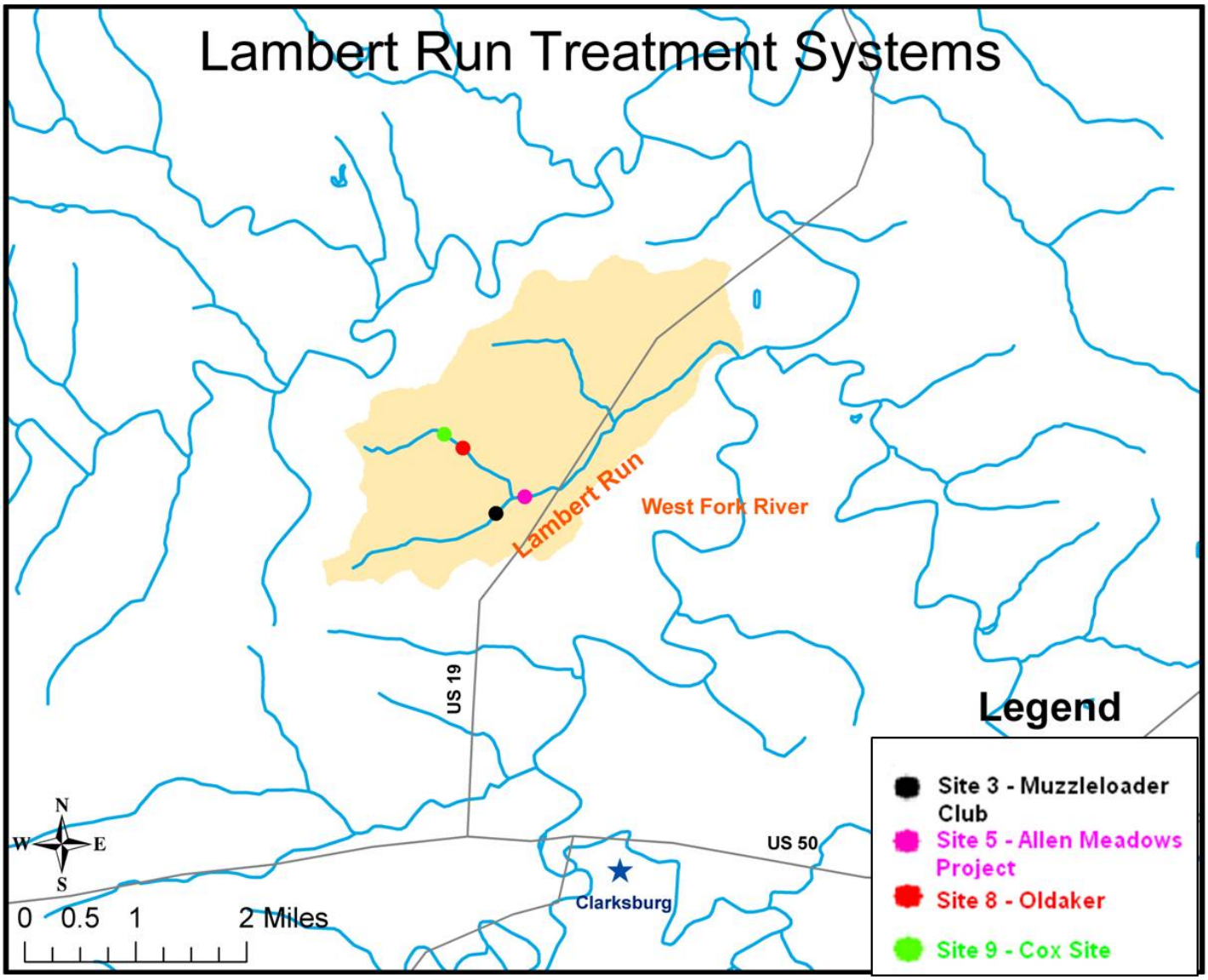
Regional Basin Coordinators

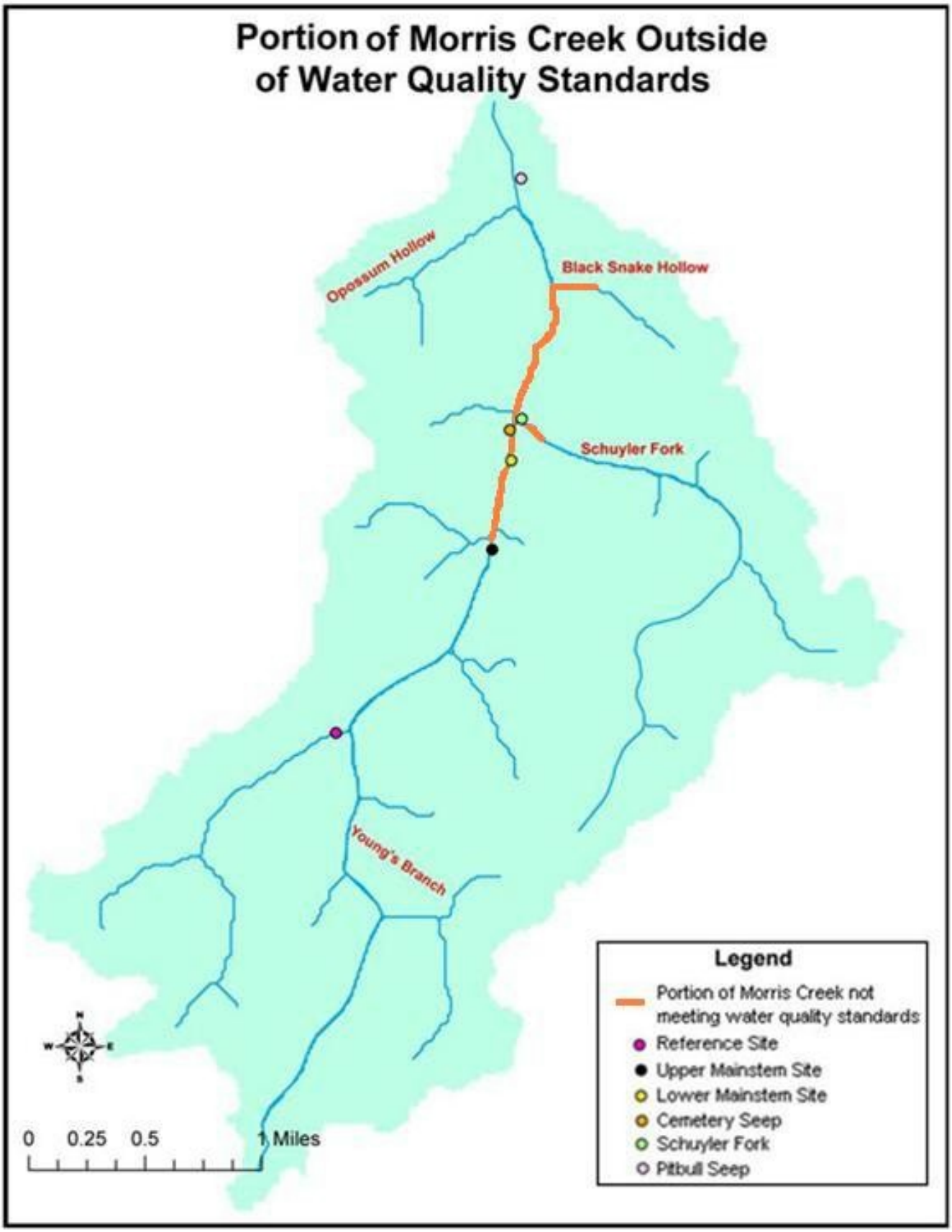
Western - vacant	jennifer.pauer@wv.gov	(304) 926-0499 ext. 1038
Southern - Jennifer DuPree	jennifer.s.dupree@wv.gov	(304) 465-1911 ext. 3070
Potomac - Alana Hartman	alana.c.hartman@wv.gov	(304) 822-7266
Monongahela - Lou Schmidt	louschmidt@frontiernet.net	(304) 783-4935
Northern - Jennifer Pauer	jennifer.pauer@wv.gov	(304) 926-0499 ext. 1038

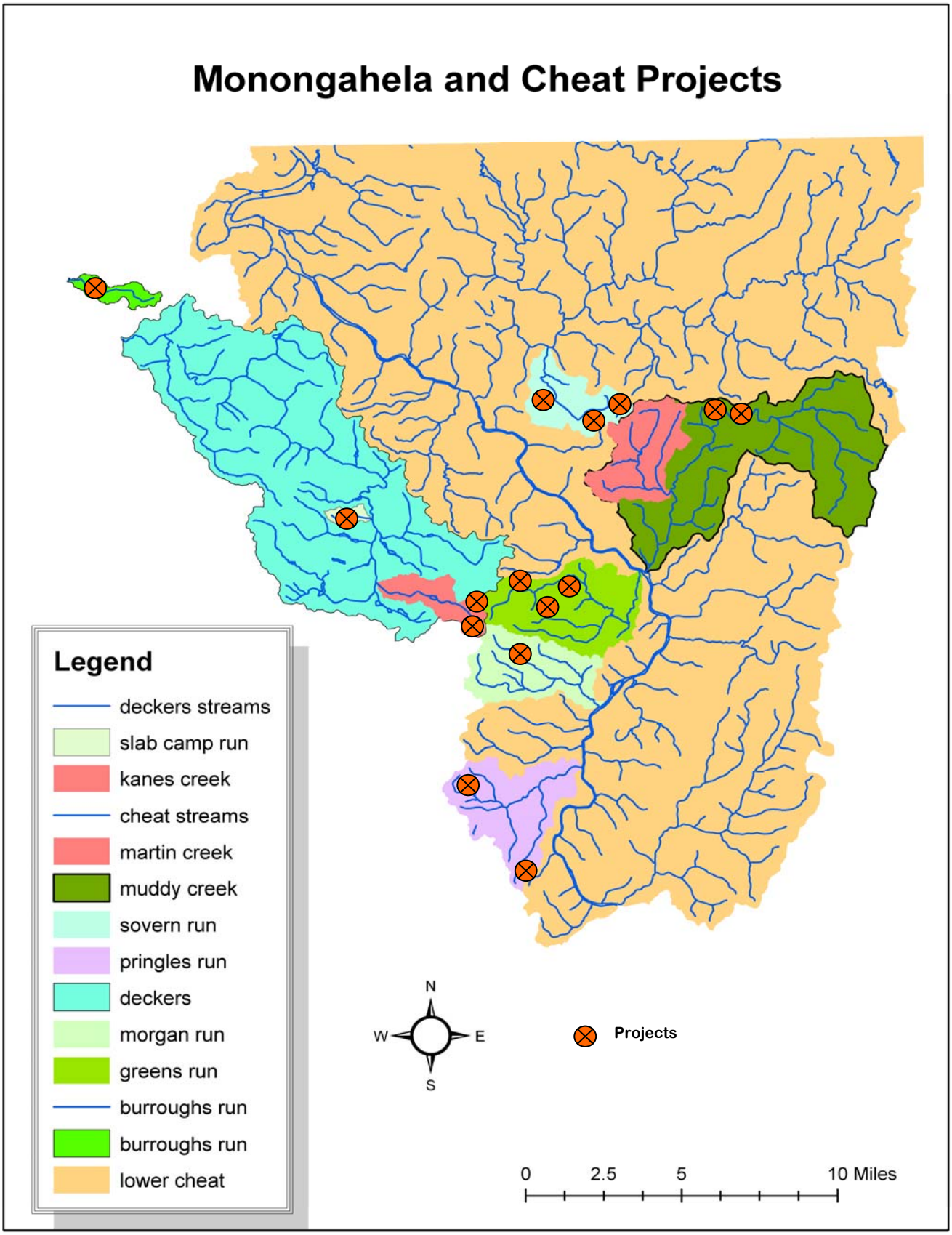
Watershed Based Plans
of the
Nonpoint Source Program



Watersheds where the Nonpoint Source Program is actvally working to set up or implement projects.







Commonly Used Acronyms

Acronym	*Meaning*
AMD	Acid mine drainage or alkaline mine drainage
AML	Abandoned Mine Lands Program
ATV	All terrain vehicle
CVI	Canaan Valley Institute
CWA	Clean Water Act
DEP or WVDEP	WV Department of Environmental Protection
DWWM	Division of Water & Waste Management
DOF	Division of Forestry
FY	Fiscal year
KCHD	Kanawha County Health Department
NPSP	Nonpoint Source Program
NRCS	Natural Resources Conservation Service
OLC	Open limestone channel
OO&G	Office of Oil & Gas
PHS	Public Health Sanitation Division
QAPP	Quality Assurance Project Plan
TMDL	Total Daily Maximum Load
VAD	Volunteer Assessment Database
WBP	Watershed based plan
WVCA	WV Conservation Agency
WVSOS	WV Save Our Streams
WVU	West Virginia University